Statement Of Objectives (SOO)

For

Live Training Transformation (LTT)/

Common Training Instrumentation Architecture (CTIA)

Product Line Development Task Order
(Draft V4.0)

1.0 Product Line Objectives:

The LTT family of systems has similarities with manageable difference. As a result STRICOM has elected to take a product line approach for the development of LTT products. The overall objectives of the LTT/CTIA program is to produce a product line which meets the operational requirements of the Army's Maneuver Combat Training Centers (MCTC), the Homestation Instrumentated Training System (HITS), Digital Multi-Purpose Range Complexes (DMPRCs), and the Military Operations in Urban Terrain (MOUT) instrumented training facilities. There are several reasons that justify the investment in the LTT product line. The following are some rational as to why:

a. Develop and maintenance costs are significantly reduced across multiple applications through reuse of technology, design, and other asset qualities. Tailorable features are built into assets to meet more than one user's needs.
b. Products are likely to be engineered through recognition of changes within fundamental requirements or product line architectures, rather than built from scratch.
c. Products have increased quality through the reuse of assets that are well understood and proven through re-testing during multiuse.
d. New technology may be more effectively incorporated through sharing of innovations.
e. Interoperability increases through use of common architectures, interfaces and protocols.
f. User/operator training requirements are reduced through the use of common components.
g. Turn around time to market is reduced and a greater confidence in the reliability and maintainability of the products generated.

The LTT/CTIA product line will be a composable "system of systems" that:

a. Supports Army force-on-force and live fire collective training exercises.
b. Supports exercise planning.
c. Provides a means to monitor and control the exercise.

d. Provides communications among the LTT subsystems, various Tactical Engagement Simulation (TES) systems, other virtual and constructive simulations and the exercising of the units actual real-world communication systems.
e. Records, adjudicates and enforces tactical engagements, direct and indirect, lethal and non-lethal weapon systems.
f. Provides a means to manage, collect, visualize, and analyze unit and individual performance data.
g. Supports development and presentation of after action reviews (AAR) and take home package (THP).
h. Provides an integration testbed laboratory that continuously supports development, prototyping, experimentation and testing for the LTT product line.

The operational requirement for common functionality at the live instrumentation sites has its basis in the Live Capstone Requirements Document (CRD) and the Operational Requirements Document (ORD). The Live CRD and ORD are expected to be supported through the CTIA/LTT design, which seeks to leverage the high degree of commonality of instrumentation requirements among the MCTCs, MOUT, DMPRC and HITS. This emphasis on commonality by the CTIA will improve the quality of training while significantly reducing the high logistics and maintenance costs associated with live training. The CTIA is critical to the achievement of the commonality objectives (initial analysis reveals approximately 90% of MCTC ORD requirements are common).

2.0 Task Order Objectives:

This Task Order (TO) has been segmented into three different lists of tasks, covering the period March 2001 to September 2003. The development activity will be spiral in nature, each period of performance feeding the other.

2.1 Period, Contract Award (Mar 01) to SEP 01
a. During this activity delivery of the CTIA Product Line Architecture Specification (PLAS) will be accomplished. This will constitute CTIA Version 0.1 (V0.1).
b. Establish the LTT/CTIA Development, Test and Integration Laboratory at STRICOM.
c. Document the Domain Analysis effort/results required to generate the PLAS in a Domain Analysis Technical Report (DATR)
d. Capture the process used during the domain analysis and the commonalties and variabilities derived in the LTT Reuse Plan.

2.2 Period SEP 02 to SEP 03
a. Continued analysis will result in the baseline of the CTIA at V1.0.

b. A Product Line Architecture Framework (PLAF) will be documented. The PLAF is a business-area-specific organization of components and their interfaces.
c. Develop a subset of the common components identified during the domain analysis.
d. Demonstrate incremental success by prototyping (using developed components) some functionality of the NTC-OIS.

2.3 Period SEP 02 to SEP 03

a. Use a combination of development and integration efforts to establish an NTC-OIS prototype that satisfies critical functional requirements at the NTC. Critical requirements will be determined by the Integrated Product Team (IPT). This activity will occur in the Development, Test and Integration Lab (DTIL)
b. Evolve the CTIA to V2.0.
c. Develop a larger subset of the common components.
d. Deliver plans for the migration of the NTC-OIS to IOC
e. Using the DTIL, include OneTESS extensions as part of the systems architecture.

3.0 Technical Objectives:

3.1 Use an open systems approach to design and develop CTIA compliant systems.

a. Ensure that the system design is sufficiently flexible and robust to allow responsiveness to changing technology and requirements.
b. Develop a product line, component-based architecture that defines the key interfaces used in the system by widely used industry standards and those selected through a consensus process.
c. Facilitate integration and use of commercial and government off-the-shelf (COTS/GOTS) products from multiple sources both in the initial design and in future enhancements.
d. Enable technology insertion as currently available commercial products mature and new commercial products become available in the future.
e. Allow for affordable interoperability, supportability and reliability.

3.2 CTIA Product Line Architecture Objectives:

a. Demonstrate how the product line architecture promotes the reuse of software artifacts across the LTT domain and how software mismatches will be rectified.
b. Define and describe the integration plans and strategies associated with integration of architecture products and components.
c. Produce a verifiable method (simulation of the architecture) of the operations of the CTIA. Verify that it is implementable and buildable.
d. Maximize the use of COTS/GOTS during the development of the LTT systems.

e. Select, adapt and extend existing architectures and standards to the maximum extent possible with new development being limited to providing essential services or components required of LTT systems.
f. Leverage off of other programs, training systems and architectures such as the Test and Training Enabling Architecture (TENA), the Mobile Automated Instrumentation Suite, Command Control Computers (MAIS C3), the Military Operations in Urban Terrain (MOUT), the Army Battle Command System (ABCS), the Army Training Information Architecture and the Army's One Semi-Automated Forces (OneSAF).
g. Develop an extensible architecture that will enable applications to be easily upgraded or modified to support add-on requirements with minimal reconstruction of the existing architecture.
h. Support the separation of data from the application.
i. Data standards must be part of the architecture.
j. Define stable interfaces to Army Training Information Architecture (ATIA) compliant systems, Army Battle Command Systems (ABCS), and High Level Architecture (HLA) compliant simulations.

3.3 Live Training Transformation (LTT) Systems Objectives:

a. Collect, analyze and use software metrics to measure both software products and processes. Utilize software metrics to aggressively track and monitor progress towards development goals and milestones and to aid in the early identification of potential problem areas and the development of appropriate corrective actions.
b. Verify that the system design, including verification, deployment, training, operational support and disposal elements satisfies the baseline.
c. Promote commonality across the family of live training systems (e.g., CTCs, MOUT and HITS).
d. Ensure that the design supports live, virtual, and constructive simulation interoperability
e. Leverage reuse from legacy systems as well as tactical systems (i.e., weapons platforms, ABCS, etc.)

3.4 LTT/CTIA Development, Test and Integration Laboratory (DTIL) Objectives:

a. Utilize the CTIA DTIL for such things as prototyping, risk mitigation, trade analyses, software verification, demonstration, etc., to help select the appropriate design concepts for satisfying the LTT systems technical and performance requirements.
b. Investigate and leverage state-of-the-art technologies that may be applicable during the development of CTIA compliant systems.
c. The DTIL will be easily accessible to the government and contractor and it should take advantage of other testbed facilities efforts.
d. During LTT/CTIA development the DTIL will be located a STRICOM. After fielding of the NTC-OIS the DTIL will be fielded to a centralized location(s) in order to support the other CTCs.

e. Establish a software development process that ensures good software engineering practices are adhered to.

4.0 Program Objectives:

a. Establish a comprehensive configuration management system. Apply configuration management to hardware, software and documentation configuration items.
b. Adopt an Integrated Process and Product Development (IPPD) process that emphasizes the following IPPD principles: customer focus (identify and satisfy the user's needs); maximum flexibility for optimization and use of contractor approaches; multidisciplinary teamwork and cooperation; empowerment; proactive identification and management of risk (cost, schedule and performance); and pre-planned conflict resolution.
c. Implement and optimize Integrated Product Teams (IPTs) to implement the IPPD principles that allow the government and contractor to work as a team.
d. Participate and cooperate in a partnering relationship that is based upon open and continuous communication, mutual trust and respect, and will promote synergy, creative thinking, pride in performance, and the creation of a shared vision for.
e. Create a program management system that will provide programmatic schedules and performance information to the government throughout the CTIA/LTT development process Develop and utilize a corporate web site to post all appropriate information and documentation.
f. Establish aggressive and proactive goals to minimize program overhead.
g. Proprietary hardware/software solutions will be worked through the IPT process.
h. Enable a planned migration of existing legacy instrumentation systems and assets at the CTCs to satisfy OIS requirements in an affordable fashion.

5.0 Support Objectives:

a. Maintain an active Reliability and Maintainability program.
b. Decreased number of unique repair parts and assemblies.
c. Decreased maintenance structure.
d. Decreased organizational training burden.
e. Increased flexibility of the approach to contractor logistics support with the benefit of supporting Logistics Directorate’s efforts to re-compete the STRICOM Live Training CLS contract.
f. Greatly improved ability to conduct system upgrades, and to integrate new weapon systems and munitions.
g. Reduce organization manpower requirements both in the government and contractor support in efforts associated with exercise rotations and maintenance activities.

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